Chapter 10

Toxics Release Inventory Data for Leather and Leather Products (SIC Code 31)

A Look at the Leather and Leather Products Industry (SIC Code 31)

The leather and leather products industry (SIC code 31) engages in tanning, currying, and finishing hides and skins. This sector manufactures finished leather and artificial leather products. Some products of this sector, such as handbags, billfolds, and card cases, may be made of leather or non-leather materials. Box 10-1 lists Standard Industrial Classification (SIC) codes and their designations for this sector. In TRI, SIC codes are given as reported by the facilities; these may differ from information in economic and other data collections.

The leather and leather products sector is the United States' smallest manufacturing sector, with shipments valued at $9.31 billion in 1996, up from $9.16 billion in 1995 (both in current dollars). This was one-quarter of one percent (0.25%) of the U.S. total value of manufacturing shipments. Although the sector's value of shipments increased from 1995 to 1996, employment decreased from 86,000 in 1995 to 77,000 in 1996. The leather and leather products sector experienced the sharpest economic decline of all U.S. manufacturing sectors in the 1990s. Production in this sector dropped 28.5% from 1989 to 1996, while production levels for all U.S. manufacturing increased 17.6% (see Chapter 1, Table 1-10).

Manufacturing of shoes (footwear, SIC code 314) generated the largest part of the sector's value of shipments ($3.61 billion) and employment (37,000) in 1996. Men's footwear (SIC code 3143) contributed the bulk of this activity, with shipments of $2.43 billion and employment of 19,000. The leather tanning and finishing industry (SIC code 311) shipped products valued at $3.13 billion and employed 15,000 in 1996. Production volume in the U.S. leather tanning and finishing industry is tied primarily to meat consumption. In contrast, the manufacture of leather products, such as shoes, is labor-intensive and strongly influenced by international trade.

Leather production begins at the time of slaughter, when hides are cured with dry salt or brine and (usually) held in cold storage. "Beamhouse" operations rehydrate the hides, remove curing salt, and apply lime (with alkaline additives) to remove

Box 10-1. SIC Code 31, Leather and Leather Products: Codes and Classifications

SIC Code		Industry Description
311	**Leather Tanning and Finishing**	
3111	Leather Tanning and Finishing	Tanning, currying, and finishing hides and skins into leather. Purchasing hides and skins for processing into leather on a contract basis by others.
313	**Boot and Shoe Cut Stock and Findings**	
3131	Boot and Shoe Cut Stock and Findings	Manufacture of leather soles, inner soles, and other boot and shoe cut stock and findings. (Includes manufacture of finished heels, whether leather or wood).
314	**Footwear, Except Rubber**	
3142	House Slippers	Manufacture of house slippers of leather or other materials.
3143	Men's Footwear, Except Athletic	Production of men's footwear designed primarily for dress, street, and work.
3144	Women's Footwear, Except Athletic	Production of women's footwear designed primarily for dress, street, and work.
3149	Footwear, Except Rubber, nec*	Production of miscellaneous shoes, such as misses', youths', boys', children's, and infants' footwear and athletic footwear.
315	**Leather Gloves and Mittens**	
3151	Leather Gloves and Mittens	Manufacture of dress, semidress, and work gloves exclusively of leather or leather with lining of other material.
316	**Luggage**	
3161	Luggage	Manufacture of luggage out of leather or other materials.
317	**Handbags and Other Personal Leather Goods**	
3171	Women's Handbags and Purses	Manufacture of women's handbags and purses of leather or other materials, except precious metal.
3172	Personal Leather Goods, Except Women's Handbags and Purses	Manufacture of small articles normally carried on the person or in a handbag, such as billfolds, key cases, and coin purses of leather or other materials, except precious metal.
319	**Leather Goods, nec***	
3199	Leather Goods, nec*	Manufacture of miscellaneous leather goods, such as saddlery, harnesses, whips, embossed leather goods, leather desk sets, razor strops, and leather belting.

***nec:** not elsewhere classified; these are generally referred to as "miscellaneous" products in their categories.

Sources

Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual, 1987*: Standard Industrial Classification (SIC) codes and industry descriptions.

U.S. Industry & Trade Outlook '98, DRI/McGraw Hill, Standard & Poor's, and U.S. Department of Commerce, International Trade Administration, 1998: economic analyses, also provides some information on environment and industrial processes for selected industries.

U.S. Census Bureau, *1996 Annual Survey of Manufactures: Statistics for Industry Groups and Industries*, M96(AS)-1, February 1998 <http://www.census.gov/prod/www/titles.html#mm>: value of shipments and employment. Supplemental data from U.S. Census Bureau <http://www.census.gov> for some industries.

McGraw-Hill Encyclopedia of Science and Technology, 8th ed., 1997: industry processes and technologies.

hair and/or epidermal tissue. Hides and skins may require degreasing; for most leathers, this process is aqueous, but for sheepskin, hydrocarbon solvents are used.

One important tanning process is chromium tannage. The tanning material consists of one-third basic chromic sulfate, accounting for the prevalence of chromium compounds in this sector's TRI reporting. Masking chemicals (often sodium formate) are used to moderate the leather's uptake of trivalent chromium. Tanneries also use enzymes to condition the grain, deliming salts, and pickling acid (a sodium chloride brine with sulfuric acid). Chromium tannage produces "chrome-in-the-blue stock" or "blue stock," named for the color of the resulting product. Manufacturers of leather products may purchase wet "blue stock" and finish the leather themselves.

An alternative to chromium tannage is vegetable tannage, involving polyphenolic extracts from bark and wood. Vegetable tannage is used for about 10% of leather production, especially leathers intended for shoe soles, insoles, belting, straps, and specialty products.

Tanneries next split the hides into grain and "blue drop"; the latter is usually used for suede. A three-part process follows: retannage, coloring, and fat liquoring. Hides and skins may undergo a second trivalent chromium tannage, natural vegetable tannage, or one of a variety of organic synthetic tannage processes. Coloring agents may be acidic, basic, direct, or reactive. In fat liquoring, tanneries lubricate the hides with oil emulsions, most often using marine or vegetable oils. A single tannery may have available hundreds of formulas for retannage, coloring, and fat liquoring, intended to produce a wide range of characteristics in leathers of various types and qualities.

The last stages of leather tanning are drying and finishing. Dried leather may be milled or flexed for suppleness and buffed with abrasives. Finishing coats consist of film-forming binder polymers, colorant (dye or pigment), carrier, and additives for adhesion. Many finishes are water-based, but lacquer top-coatings are also used. Repeated applications are common. Those who purchase tanned and finished leather may also apply further finishing steps in the course of manufacturing leather products.

1996 TRI Data for Leather and Leather Products

Table 10-1 summarizes TRI reporting by the leather and leather products sector for 1996. The sector submitted 223 forms in 1996. Of these, 14 were Form A certification statements, certifying that a facility's total annual reportable amount of a TRI chemical was less than 500 pounds for the year and that the facility did not manufacture, process, or otherwise use more than 1 million pounds. (The Form A certification statement is explained in Chapter 1.)

The leather tanning and finishing industry (SIC code 3111) submitted the largest number of forms in this sector in 1996: 166 forms, or 74.4% of the sector's total. Men's footwear (SIC code 3143) submitted 16 forms, and miscellaneous footwear (SIC code 3149) submitted 15. These were 7.2% and 6.7%, respectively, of the total number of forms in leather and leather products.

The leather tanning and finishing industry (SIC code 3111) reported the large majority of the sector's releases and waste management, as shown in Table 10-1. This industry reported 2.0 million pounds of on-site releases, which was 73.7% of the sector's total of 2.7 million pounds, and almost all (99.2%) of the sector's 1.5 million pounds of off-site releases (transfers to disposal). The leather tanning and finishing industry's total on- and off-site releases of 3.5 million pounds amounted to 82.9% of the sector's total of 4.2 million pounds.

Table 10-1. Summary of TRI Information by 4-digit SIC Code, 1996: Leather and Leather Products, SIC Code 31

Total On- and Off-site Releases Rank	Total Production-related Waste Rank	SIC Code	Industry	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds
1	1	3111	Leather Tanning & Finishing	54	166	9	2,002,032	1,514,336	3,516,368
7	7	3131	Footwear Cut Stock	1	1	0	250	0	250
2	2	3143	Men's Footwear, Except Athletic	12	16	1	238,641	24	238,665
5	6	3144	Women's Footwear, Except Athletic	3	3	0	29,683	0	29,683
3	3	3149	Footwear, Except Rubber, nec*	10	15	4	221,391	9,058	230,449
4	4		Multiple within SIC Code 31	5	11	0	221,614	0	221,614
6	5		Invalid SIC Code within SIC Code 31	4	11	0	1,453	3,407	4,860
			Total for SIC Code 31	89	223	14	2,715,064	1,526,825	4,241,889

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Three industries reported approximately 5% each of the sector's total on- and off-site releases. These were men's footwear (SIC code 3143) with 239,000 pounds, miscellaneous footwear (SIC code 3149) with 230,000 pounds, and the group of forms that reported multiple SIC codes in SIC code 31 with 222,000 pounds. In all three cases, the majority of the releases were reported as on-site releases. The miscellaneous footwear industry (SIC code 3149) ranked second (after leather tanning and finishing) for off-site releases (transfers to disposal), with 9,000 pounds. This represented 0.6% of the sector's total off-site releases.

The leather tanning and finishing industry (SIC code 3111) also reported 99.0% of the sector's 4.2 million pounds of other on-site waste management and 97.8% of the sector's 1.8 million pounds of transfers off-site for further waste management. Men's footwear (SIC code 3143) ranked second for both other on-site waste management, with 5,900 pounds (0.1% of the sector's total), and transfers off-site for further waste management, with 21,000 pounds (1.2% of the sector's total).

For total production-related waste, the leather tanning and finishing industry reported 9.4 million pounds, or 92.2% of the sector's 10.2 million-pound total. The same three leather and leather products industries that reported comparable amounts of total releases also reported approximately 2% each of the sector's total production-related waste: men's footwear (SIC code 3143) with 256,000 pounds, miscellaneous footwear (SIC code 3149) with 238,000 pounds, and the multiple-codes group with 229,000 pounds.

Multiple SIC Codes in SIC Code 31

Several facilities in the leather and leather products sector engage in activities that are classified in distinct, but separate, SIC codes. For example, a facility may produce both men's footwear (SIC code 3143) and pieces used in shoe construction (footwear cut stock, SIC code 3131). These facilities may report multiple SIC codes on their TRI forms. (Box 1-5 in Chapter 1 further explains reporting of multiple SIC codes and its affect on the analyses presented in the TRI data release.)

Table 10-2 further examines multiple-codes reporting in the leather and leather products sector. Eleven forms reported more than one four-digit SIC code within SIC code 31, as shown in Table 10-2. Most of these (8 forms) combined men's footwear (SIC code 3143) and women's footwear (SIC code

Table 10-1. Summary of TRI Information by 4-digit SIC Code, 1996: Leather and Leather Products, SIC Code 31, Continued

SIC Code	Industry	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3111	Leather Tanning & Finishing	4,184,589	1,782,858	9,374,393	6,122
3131	Footwear Cut Stock	0	750	348	0
3143	Men's Footwear, Except Athletic	5,900	21,133	255,952	0
3144	Women's Footwear, Except Athletic	0	3,393	31,715	0
3149	Footwear, Except Rubber, nec*	642	6,573	237,721	0
	Multiple within SIC Code 31	0	8,538	229,292	0
	Invalid SIC Code within SIC Code 31	33,885	637	39,459	0
	Total for SIC Code 31	4,225,016	1,823,882	10,168,880	6,122

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Table 10-2. Multiple SIC Codes, 1996: Leather and Leather Products, SIC Code 31

SIC Codes		Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3131	3143	3	0	102,439	0	102,439	0	7,700	109,916	0
3143	3144	8	0	119,175	0	119,175	0	830	119,376	0
Total for SIC Code 31		11	0	221,614	0	221,614	0	8,538	229,292	0

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** are transfers off-site to disposal from Section 6 of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 of Form R. **Total Production-related Waste** sums Section 8 of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents).

3144). This combination reported 119,000 pounds of total on- and off-site releases and 119,000 pounds of total production-related waste in 1996.

On- and Off-site Releases

The leather and leather products sector reported air emissions totaling 2.7 million pounds in 1996, nearly two-thirds (62.6%) of the sector's total on- and off-site releases. Off-site releases (transfers to disposal) totaled 1.5 million pounds, 36.0% of the sector's total releases. The sector reported much smaller amounts of surface water discharges (54,000 pounds) and on-site land releases (7,000 pounds). The leather and leather products sector reported no underground injection. Table 10-3 presents the sector's reporting of on- and off-site releases by four-digit SIC code for 1996. Figure 10-1 illustrates the distribution of releases by type.

The leather tanning and finishing industry (SIC code 3111) reported the largest amounts of air emissions (1.9 million pounds) and off-site releases (1.5 million pounds). The industry's reported air emissions included 1.2 million pounds of glycol ethers, and the off-site releases included 1.2 million pounds of chromium compounds. The leather tanning and finishing industry also reported all of the sector's surface water discharges and other on-site land releases.

As noted above, three industry groups reported roughly equal amounts of the sector's total on- and off-site releases: men's footwear (SIC code 3143),

Table 10-3. TRI On-site and Off-site Releases, 1996: Leather and Leather Products, SIC Code 31 (in Rank Order)

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Underground Injection Class II-V Wells Pounds	On-site Land Releases RCRA Subtitle C Landfills Pounds	On-site Land Releases Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
3111	Leather Tanning & Finishing	1,941,895	53,526	0	0	0	6,611	2,002,032	1,514,336	3,516,368
3143	Men's Footwear, Except Athletic	238,641	0	0	0	0	0	238,641	24	238,665
3149	Footwear, Except Rubber, nec *	221,391	0	0	0	0	0	221,391	9,058	230,449
	Multiple within SIC Code 31	221,614	0	0	0	0	0	221,614	0	221,614
3144	Women's Footwear, Except Athletic	29,683	0	0	0	0	0	29,683	0	29,683
	Invalid SIC Code within SIC Code 31	1,453	0	0	0	0	0	1,453	3,407	4,860
3131	Footwear Cut Stock	250	0	0	0	0	0	250	0	250
	Total for SIC Code 31	2,654,927	53,526	0	0	0	6,611	2,715,064	1,526,825	4,241,889

Note: On-site Releases from Section 5 of Form R**. Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

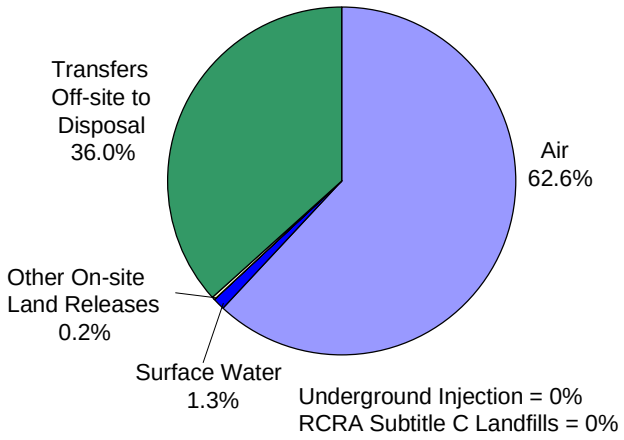


Figure 10-1. Distribution of TRI On-site and Off-site Releases, 1996: Leather and Leather Products (SIC Code 31)

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R.

miscellaneous footwear (SIC code 3149), and the multiple-codes forms. All releases reported by these three groups were air emissions, except for 9,000 pounds of off-site releases reported by the miscellaneous footwear industry and 24 pounds of off-site releases reported by the men's footwear industry.

Figure 10-2 shows the distribution of on- and off-site releases for the industries (four-digit SIC code) in the leather and leather products sector.

Other On-site Waste Management

The leather and leather products sector reported 3.6 million pounds of on-site treatment in 1996, which was 85.7% of the sector's total other on-site waste management. The sector also reported 604,000 pounds of on-site recycling, 14.3% of the total. No energy recovery was reported by the leather and leather products industries. Table 10-4 presents the sector's 1996 reporting of other on-site waste management. Figure 10-3 illustrates the distribution of these data by waste management method.

As in other categories, the leather tanning and finishing industry (SIC code 3111) reported the bulk of the sector's other on-site waste management. This industry reported 3.6 million pounds of on-site treatment, including 2.0 million pounds of formic acid treated on-site. The leather and tanning industry also reported 598,000 pounds of on-site recycling.

Few other industries in this sector reported other on-site waste management, as shown in Table 10-4. Figure 10-4 illustrates the distribution of on-site waste management reporting for the industries in the leather and leather products sector.

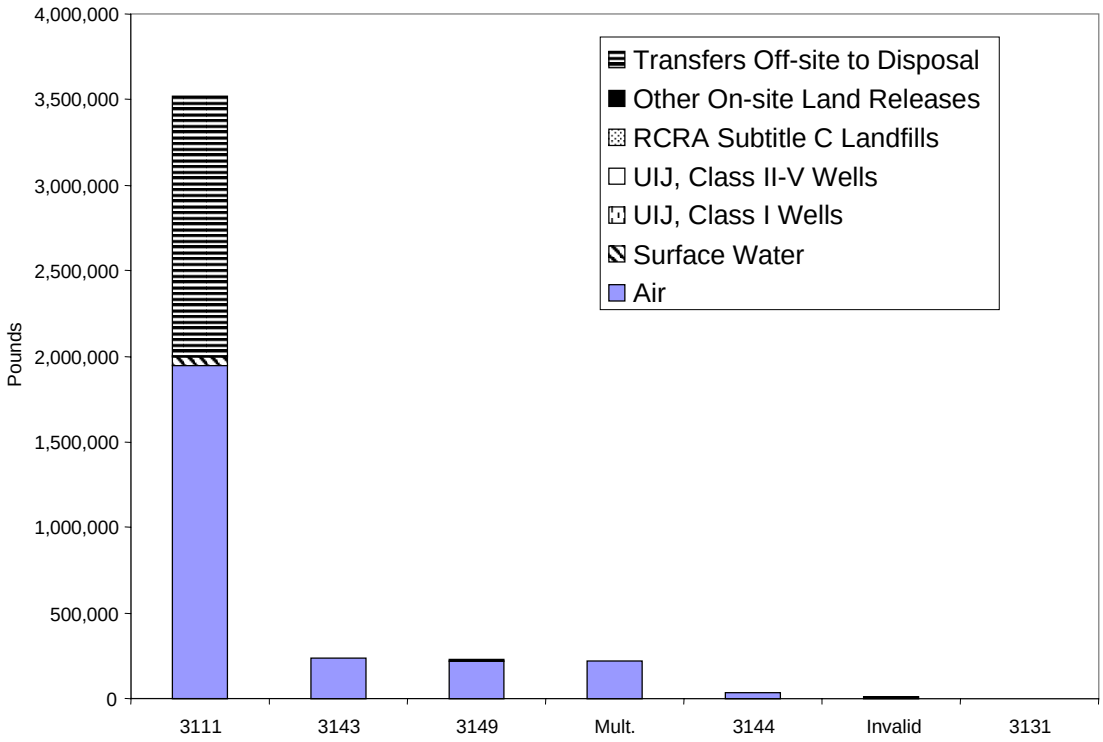


Figure 10-2. TRI On-site and Off-site Releases, SIC Codes with Largest Releases, 1996: Leather and Leather Products (SIC Code 31)

Note: On-site Releases from Section 5 of Form R. **Off-site Releases f**rom Section 6 (transfers off-site to disposal). **UIJ** = underground injection. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category. Invalid SIC codes are codes beginning "31" that do not exist in the current Standard Industrial Classification code system.

Table 10-4. TRI Other On-site Waste Management, 1996: Leather and Leather Products, SIC Code 31 (in Rank Order)

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3111	Leather Tanning & Finishing	597,780	0	3,586,809	4,184,589
	Invalid SIC Code within SIC Code 31	0	0	33,885	33,885
3143	Men's Footwear, Except Athletic	5,900	0	0	5,900
3149	Footwear, Except Rubber, nec*	642	0	0	642
3131	Footwear Cut Stock	0	0	0	0
3144	Women's Footwear, Except Athletic	0	0	0	0
	Multiple within SIC Code 31	0	0	0	0
	Total for SIC Code 31	604,322	0	3,620,694	4,225,016

Note: Other On-site Waste Management from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified

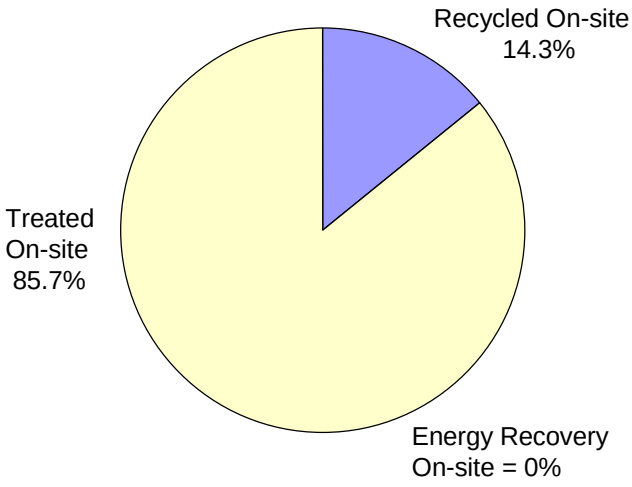


Figure 10-3. Distribution of TRI Other On-site Waste Management, 1996: Leather and Leather Products (SIC Code 31)

Note: Data from Section 8 of Form R.

Transfers Off-site for Further Waste Management

As shown in Table 10-5, the leather and leather products sector reported 1.3 million pounds of transfers to POTWs in 1996. This amounted to 70.7% of the sector's total transfers off-site for further waste management. The sector also reported 338,000 pounds of transfers to recycling and 167,000 pounds of transfers to energy recovery. These amounts represented 18.5% and 9.2%, respectively, of the sector's total. Figure 10-5 illustrates the percentage distribution of transfers off-site for further waste management reported by the leather and leather products sector.

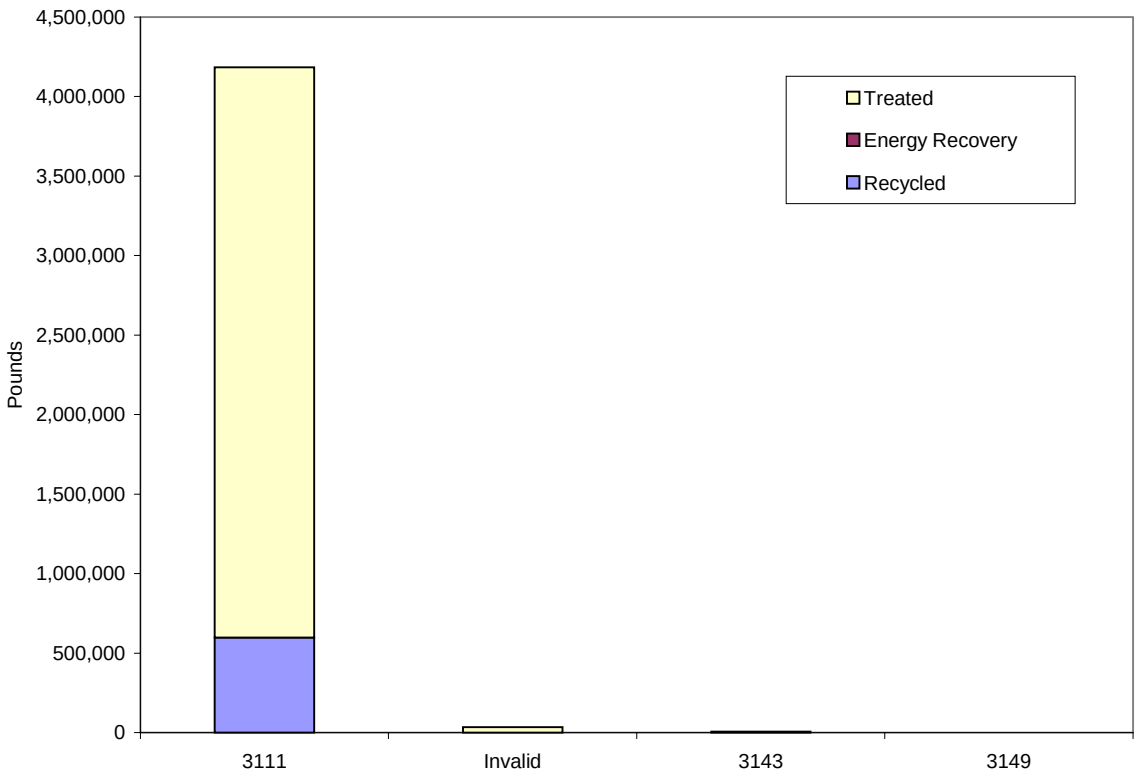


Figure 10-4. TRI Other On-site Waste Management, SIC Codes with Largest Totals, 1996: Leather and Leather Products (SIC Code 31)

Note: Other On-site Waste Management from Section 8 of Form R. Invalid SIC codes are codes beginning "31" that do not exist in the current Standard Industrial Classification code system.

Table 10-5. TRI Transfers Off-site for Further Waste Management, 1996: Leather and Leather Products, SIC Code 31 (in Rank Order)

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Off-site Transfers for Further Waste Management Pounds
3111	Leather Tanning & Finishing	335,880	136,787	21,010	1,289,181	0	1,782,858
3143	Men's Footwear, Except Athletic	980	12,222	7,931	0	0	21,133
	Multiple within SIC Code 31	440	8,098	0	0	0	8,538
3149	Footwear, Except Rubber, nec*	0	6,573	0	0	0	6,573
3144	Women's Footwear, Except Athletic	0	3,393	0	0	0	3,393
3131	Footwear Cut Stock	0	0	0	750	0	750
	Invalid SIC Code within SIC Code 31	255	0	83	299	0	637
	Total for SIC Code 31	337,555	167,073	29,024	1,290,230	0	1,823,882

Note: Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

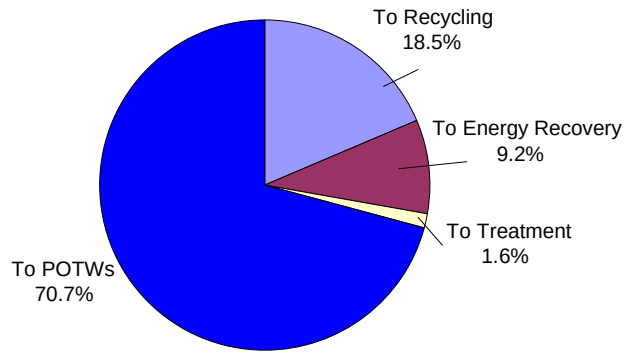


Figure 10-5. Distribution of TRI Transfers Off-site for Further Waste Management, 1996: Leather and Leather Products (SIC Code 31)

Note: Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R.

The leather tanning and finishing industry (SIC code 3111) again reported the largest amounts in each transfer type, including 1.3 million pounds of transfers to POTWs and 336,000 pounds of transfers to recycling. The chemical reported in the largest amount was ammonia (796,000 pounds to POTWs). No other leather industry reported more than 1,000 pounds in either of these categories.

The leather tanning and finishing industry (SIC code 3111) also reported the largest amounts transferred to energy recovery (137,000 pounds) and treatment (21,000 pounds). In these categories, the men's footwear industry (SIC code 3143) reported the second-largest amounts (12,000 pounds and 8,000 pounds, respectively).

Figure 10-6 illustrates the distribution of off-site transfers for further waste management for the industries in this sector.

1996 TRI Data by State for Leather and Leather Products

As shown in Table 10-6, leather and leather products industries reported to TRI in about half the U.S. states (25 states plus Puerto Rico). The largest number of forms were submitted in Wisconsin (33 forms or 14.8% of the sector's total). Michigan ranked second, with 25 forms (11.2%). In both New York and Pennsylvania, 19 forms were submitted (8.5% each).

Wisconsin and Michigan were also the states with the largest reported releases (on-site, off-site, and total on- and off-site). In Wisconsin, releases totaled 964,000 pounds (22.7% of the sector's total). Wisconsin's reported releases consisted of 549,000 pounds of on-site releases (20.2% of the

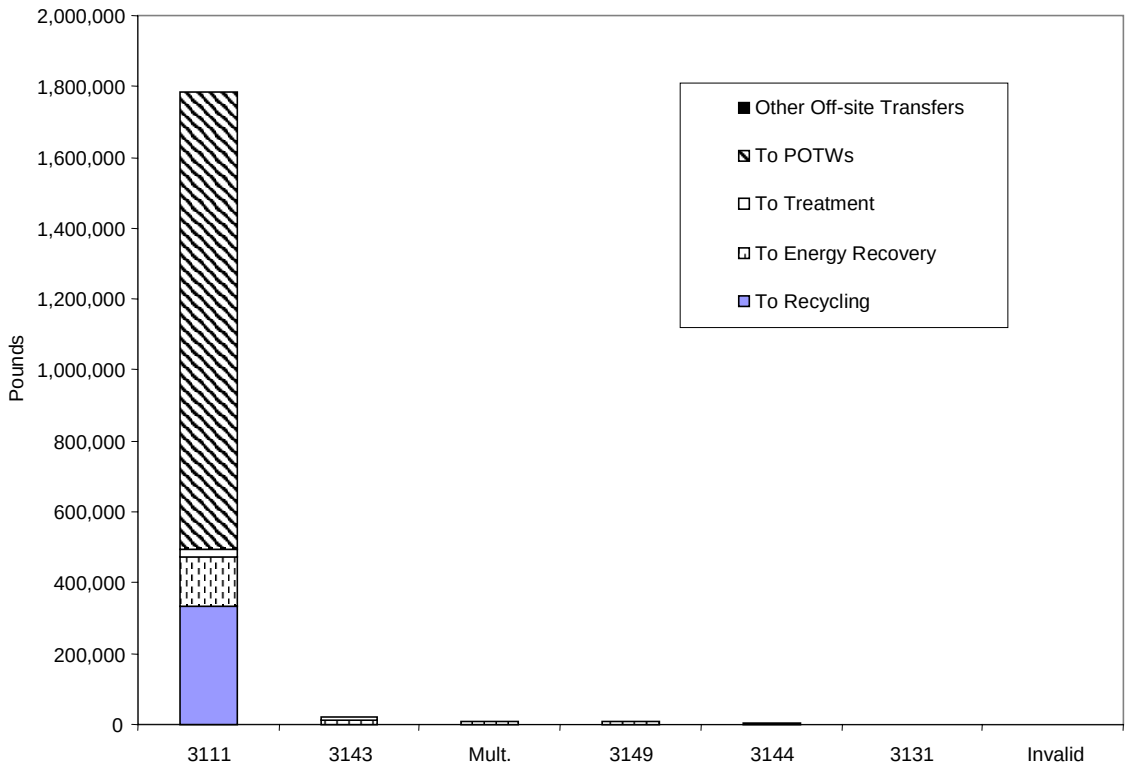


Figure 10-6. TRI Transfers Off-site for Further Waste Management, SIC Codes with Largest Totals, 1996: Leather and Leather Products (SIC Code 31)

Note: Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category. Invalid SIC codes are codes beginning "31" that do not exist in the current Standard Industrial Classification code system.

total) and 415,000 pounds of off-site releases (27.2%). Michigan's reported releases totaled 663,000 pounds (15.6%), including 317,000 pounds (11.7%) on-site and 346,000 pounds off-site (22.6%).

Maine ranked third for total on- and off-site releases, with 372,000 pounds (8.8%). Maine was also third for on-site releases (285,000 pounds, or 10.5%). Missouri ranked third for off-site releases (124,000 pounds, or 8.1%).

The leather and leather products sector's largest other on-site waste management was reported in Michigan, with 921,000 pounds, or 21.8% of the sector's total other on-site waste management. Maine ranked second in this category, with 658,000 pounds, or 15.6%, and Pennsylvania ranked third, with 498,000 pounds, or 11.8%.

States with the sector's largest reported transfers off-site for further waste management were Wisconsin with 325,000 pounds (17.8% of the total), Missouri with 192,000 pounds and Pennsylvania with 191,000 pounds (10.5% each).

In both Wisconsin and Michigan, the leather and leather products sector reported 1.7 million pounds of total production-related waste, or 16.4% each of the sector's total. Maine was the state with the next-largest reported total production-related waste, 1.1 million pounds, or 11.2%.

Table 10-6. Summary of TRI Information by State, 1996: Leather and Leather Products, SIC Code 31

State	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
Arkansas	2	2	0	21,036	0	21,036	0	385	21,421	0
California	1	3	0	90,580	13,182	103,762	140,000	11,300	254,800	0
Florida	1	1	0	19,130	4	19,134	0	65	19,000	0
Georgia	1	1	0	720	24	744	5,900	0	6,640	0
Illinois	4	9	0	148,790	73,084	221,874	0	38,809	260,423	0
Indiana	1	1	0	8,647	0	8,647	0	3,008	10,294	0
Iowa	1	4	0	9,805	91,000	100,805	2,200	66,700	169,740	0
Kentucky	1	1	0	10,806	0	10,806	0	250	10,863	0
Maine	7	16	3	284,721	86,837	371,558	657,976	107,538	1,137,837	0
Maryland	1	9	0	172,831	37,500	210,331	396,500	112,000	647,625	0
Massachusetts	6	17	0	30,992	74,632	105,624	323,346	68,229	385,489	0
Michigan	6	25	0	317,441	345,708	663,149	920,891	147,538	1,669,482	6,122
Minnesota	4	12	2	186,824	39,751	226,575	54,000	176,825	518,296	0
Missouri	3	6	0	16,205	123,983	140,188	444,000	192,330	777,205	0
Nebraska	1	5	0	29,697	51,530	81,227	0	62,693	143,930	0
New Hampshire	1	2	0	23,129	4,065	27,194	0	4,825	32,019	0
New Jersey	2	4	0	35,955	105,446	141,401	396,693	46,936	585,030	0
New York	9	19	0	69,942	15,099	85,041	38,813	18,965	144,217	0
North Carolina	2	6	0	227,630	0	227,630	4,780	25	232,434	0
Oregon	2	5	0	29,935	22,144	52,079	0	61,339	113,263	0
Pennsylvania	7	19	1	229,473	15,326	244,799	498,421	191,437	926,599	0
Puerto Rico	4	6	0	50,786	0	50,786	2	11,597	62,242	0
Tennessee	4	7	0	30,077	12,807	42,884	28,642	18,797	61,244	0
Texas	4	6	0	120,787	0	120,787	30,000	157,267	308,243	0
Utah	1	4	4	0	0	0	0	0	0	0
Wisconsin	13	33	4	549,125	414,703	963,828	282,852	325,024	1,670,544	0
Total for SIC Code 31	89	223	14	2,715,064	1,526,825	4,241,889	4,225,016	1,823,882	10,168,880	6,122

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents).

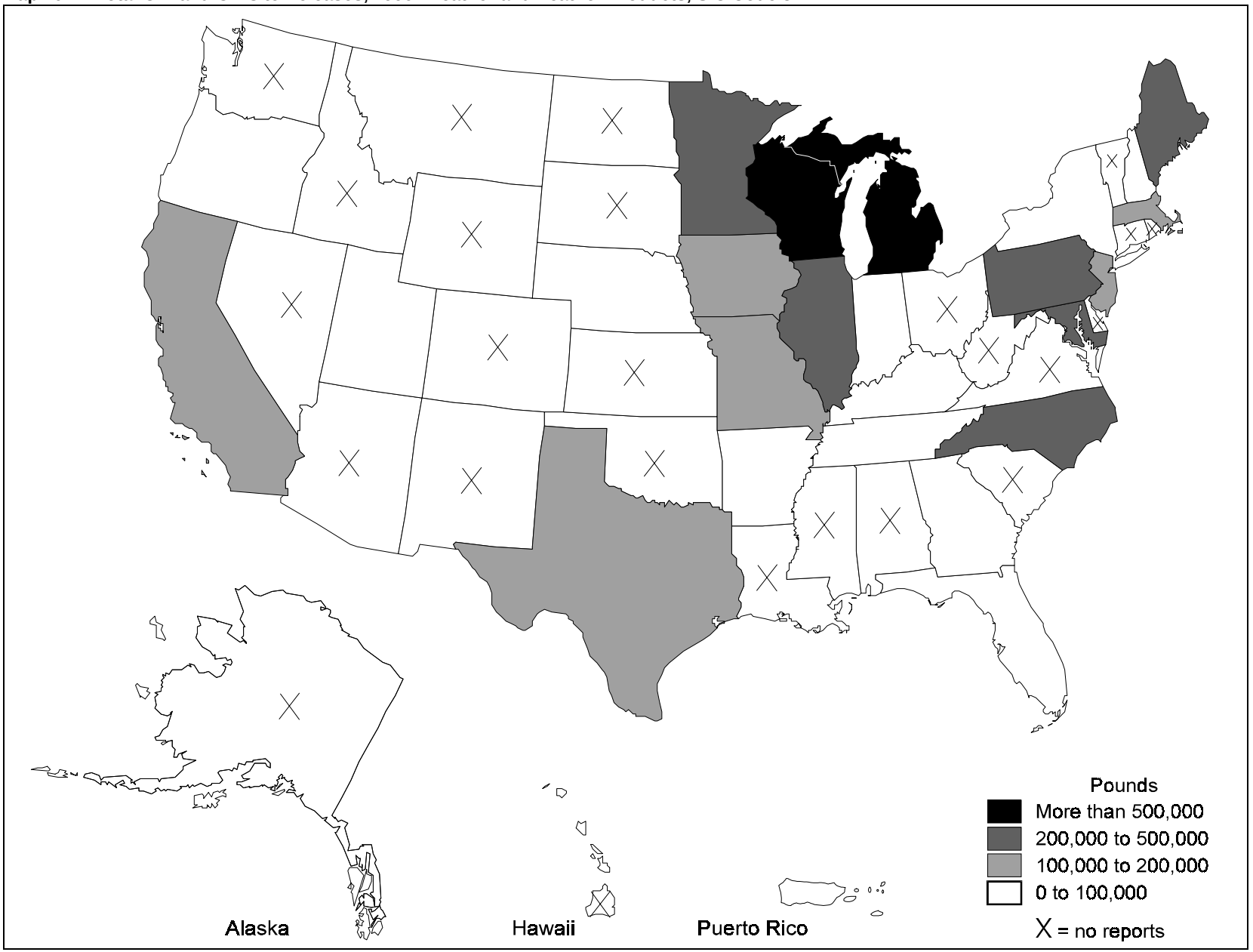
Map 10-1 illustrates the geographic distribution of total on- and off-site releases in the leather and leather products sector.

1996 TRI Data by Chemical for Leather and Leather Products

The top 15 chemicals for total on- and off-site releases in the leather and leather products sector in 1996 appear in Table 10-7. Releases of these chemicals totaled 4.2 million pounds, or 98.9% of all releases reported in this sector. The sector reported 2.6 million pounds of air emissions of these chemicals and 1.5 million pounds of off-site releases (transfers to disposal). Both amounts represented approximately 99% of the sector's totals in those categories.

Glycol ethers was the chemical reported in the largest amount, with 1.22 million pounds, mostly reported as air emissions. All of the air emissions of this chemical were reported by the leather tanning and finishing industry (SIC code 3111), which uses glycol ethers in coating processes. Chromium compounds ranked second for total releases, with 1.18 million pounds, almost entirely as off-site releases (transfers to disposal). The leather tanning and finishing industry reported the bulk (99.5%) of the off-site releases of chromium compounds, used in tanning hides and skins.

Map 10-1. Total On- and Off-site Releases, 1996: Leather and Leather Products, SIC Code 31



Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R.

Table 10-7. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1996: Leather and Leather Products, SIC Code 31 (in Rank Order)

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Underground Injection Class II-V Wells Pounds	On-site Land Releases RCRA Subtitle C Landfills Pounds	On-site Land Releases Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
--	Glycol ethers	1,181,573	5	0	0	0	5	1,181,583	34,555	1,216,138
--	Chromium compounds	1,628	1,268	0	0	0	2,447	5,343	1,170,842	1,176,185
108-88-3	Toluene	516,408	0	0	0	0	0	516,408	0	516,408
78-93-3	Methyl ethyl ketone	358,911	0	0	0	0	0	358,911	0	358,911
--	Manganese compounds	530	526	0	0	0	5	1,061	178,200	179,261
872-50-4	N-Methyl-2-pyrrolidone	154,838	0	0	0	0	250	155,088	5,480	160,568
7664-41-7	Ammonia	132,456	3,466	0	0	0	379	136,301	15,356	151,657
7440-47-3	Chromium	10	250	0	0	0	3,525	3,785	111,207	114,992
71-36-3	n-Butyl alcohol	73,516	0	0	0	0	0	73,516	0	73,516
108-10-1	Methyl isobutyl ketone	68,257	0	0	0	0	0	68,257	0	68,257
1330-20-7	Xylene (mixed isomers)	54,006	0	0	0	0	0	54,006	0	54,006
--	Nitrate compounds	0	48,000	0	0	0	0	48,000	100	48,100
64-18-6	Formic acid	37,252	0	0	0	0	0	37,252	260	37,512
75-09-2	Dichloromethane	21,507	0	0	0	0	0	21,507	0	21,507
127-18-4	Tetrachloroethylene	19,130	0	0	0	0	0	19,130	4	19,134
	Subtotal	2,620,022	53,515	0	0	0	6,611	2,680,148	1,516,004	4,196,152
	Total for SIC Code 31	2,654,927	53,526	0	0	0	6,611	2,715,064	1,526,825	4,241,889

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R.

Table 10-8. TRI On-site and Off-site Releases of OSHA Carcinogens by 4-digit SIC Code, 1996: Leather and Leather Products, SIC Code 31 (in Rank Order)

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Underground Injection Class II-V Wells Pounds	On-site Land Releases RCRA Subtitle C Landfills Pounds	On-site Land Releases Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
3111	Leather Tanning & Finishing	25,767	0	0	0	0	0	25,767	9	25,776
3143	Men's Footwear, Except Athletic	21,507	0	0	0	0	0	21,507	0	21,507
	Invalid SIC Code within SIC Code 31	125	0	0	0	0	0	125	541	666
3131	Footwear Cut Stock	250	0	0	0	0	0	250	0	250
	Subtotal	47,649	0	0	0	0	0	47,649	550	48,199
	Total for SIC Code 31	2,654,927	53,526	0	0	0	6,611	2,715,064	1,526,825	4,241,889

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R.

As noted earlier, the leather tanning and finishing industry also reported all of the sector's surface water discharges and on-site land releases, including amounts for the top 15 chemicals, as shown in Table 10-7.

OSHA Carcinogens

As shown in Table 10-8, the leather and leather products sector reported releasing 48,000 pounds of chemicals designated as OSHA carcinogens in 1996. (OSHA carcinogens and the bases for their designation appear in Box 1-9 in Chapter 1.) Almost all of these releases were reported as air emissions. The leather tanning and finishing industry (SIC code 3111) reported 26,000 pounds, and men's footwear (SIC code 3143) reported 22,000 pounds of total air emissions.

Dichloromethane and tetrachloroethylene ranked 14th and 15th for total on- and off-site releases in this sector and are OSHA carcinogens. Leather and leather products facilities reported releasing 22,000 pounds of dichloromethane and 19,000 pounds of

tetrachloroethylene (see Table 10-7). The sector also reported releases of two other OSHA carcinogens: formaldehyde (7,000 pounds) and nickel compounds (less than 1,000 pounds).

The men's footwear industry (SIC code 3143) reported all of the releases of dichloromethane. The leather tanning and finishing industry (SIC code 3111) reported most of the releases of the other three OSHA carcinogens. For each of the four chemicals, one or two facilities reported all of the releases.

Figure 10-7 shows the on- and off-site releases of the four-digit SIC codes in this sector that reported OSHA carcinogen releases.

1996 TRI Chemicals in Waste for Leather and Leather Products

The leather and leather products sector reported 10.2 million pounds of total production-related waste in 1996. Most of the total was reported as released on- and off-site (4.6 million pounds) or as treated on-site (3.6 million pounds), as shown in Table 10-9. Together, these methods of waste management accounted for 80.4% of the sector's total production-related waste. The sector also reported 951,000 pounds of off-site treatment and

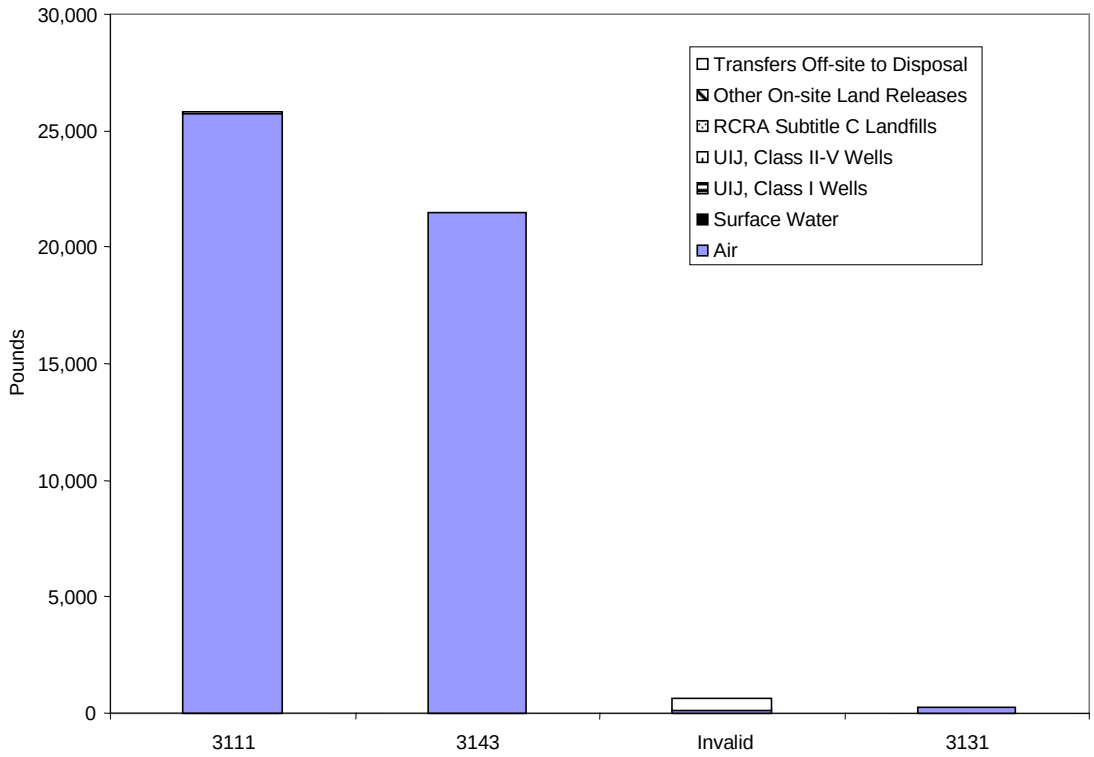


Figure 10-7. TRI On-site and Off-site Releases of OSHA Carcinogens, SIC Codes with Largest Totals, 1996: Leather and Leather Products (SIC Code 31)

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. **UIJ** = underground injection. Invalid SIC codes are codes beginning "31" that do not exist in the current Standard Industrial Classification code system.

Table 10-9. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1996: Leather and Leather Products, SIC Code 31 (in Rank Order)

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Recycled Off-site Pounds	Energy Recovery Off-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3111	Leather Tanning & Finishing	597,780	0	3,586,809	270,818	136,705	939,320	3,842,961	9,374,393	6,122
3143	Men's Footwear, Except Athletic	5,900	0	0	980	12,160	8,113	228,799	255,952	0
3149	Footwear, Except Rubber, nec*	642	0	0	0	6,759	0	230,320	237,721	0
	Multiple within SIC Code 31	0	0	0	440	8,098	0	220,754	229,292	0
	Invalid SIC Code within SIC Code 31	0	0	33,885	255	0	458	4,861	39,459	0
3144	Women's Footwear, Except Athletic	0	0	0	0	385	3,088	28,242	31,715	0
3131	Footwear Cut Stock	0	0	0	0	0	340	8	348	0
	Total for SIC Code 31	604,322	0	3,620,694	272,493	164,107	951,319	4,555,945	10,168,880	6,122

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

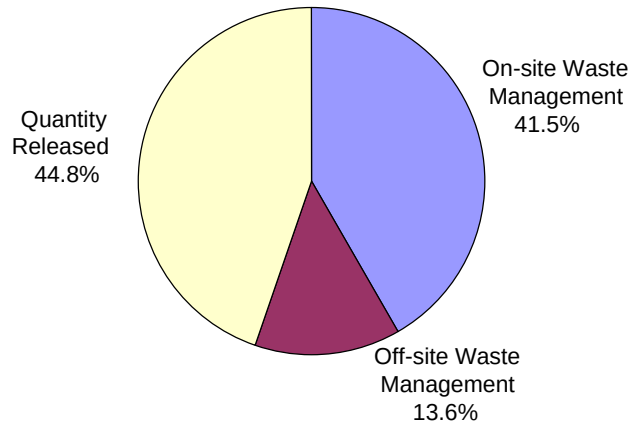


Figure 10-8. Distribution of TRI Production-related Waste, 1996: Leather and Leather Products (SIC Code 31)

Note: Data from Section 8 of Form R.

604,000 pounds of on-site recycling. These amounts represented 9.4% and 5.9%, respectively, of the sector's total production-related waste. Figure 10-8 illustrates the distribution of the sector's reporting of production-related waste.

The leather tanning and finishing industry (SIC code 3111) reported more that 80% of all types of waste management reported in this sector, including 98% or more of the on-site and off-site recycling and treatment. This industry reported 3.8 million pounds released on- and off-site and 3.6 million pounds of on-site treatment.

As noted earlier, three industries reported similar amounts of total production-related waste. Almost all of their production-related waste was reported as quantities released. These industries were men's footwear (SIC code 3143) with 256,000 pounds of total production-related waste, miscellaneous footwear (SIC code 3149) with 238,000 pounds, and the multiple SIC codes group with 229,000 pounds.

Distribution of production-related waste for the industries in the leather and leather products sector appears in Figure 10-9.

Projected Quantities of TRI Chemicals in Waste

The leather and leather products sector projected a 7.8% reduction in reported production-related waste by 1998, as shown in Table 10-10. (As explained in Chapter 1, facilities not only report current data but project waste management quantities for the next two years in their TRI submissions.) The sector projected a decrease from 10.2 million pounds of total production-related waste in 1996 to 9.4 million pounds in 1998.

The sector projected reductions in all types of production-related waste, except for a 5.8% increase in off-site recycling, from 272,000 pounds in 1996 to 288,000 pounds in 1998. (No on-site energy recovery was reported in 1996 or projected for 1998).

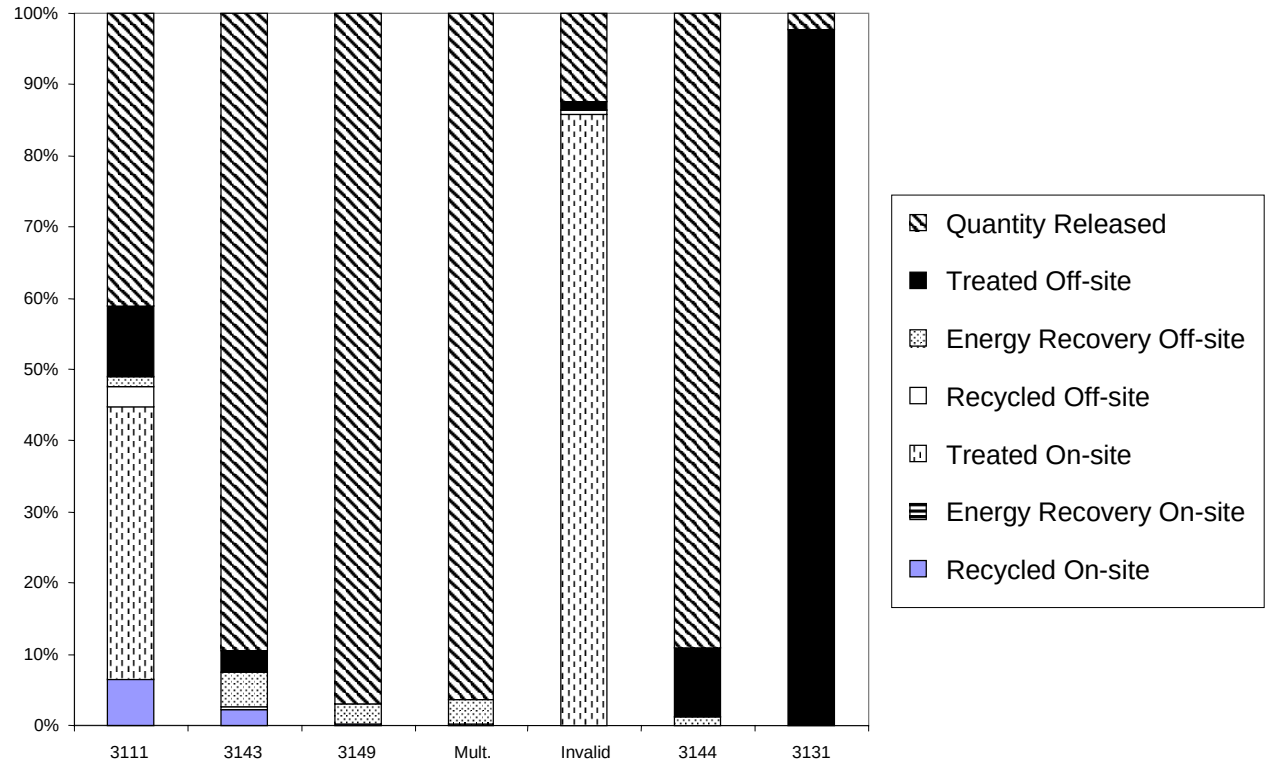


Figure 10-9. Distribution of Production-related Waste, SIC Codes with Largest Totals, 1996: Leather and Leather Products (SIC Code 31)

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category. Invalid SIC codes are codes beginning "31" that do not exist in the current Standard Industrial Classification code system.

The largest component of the overall reduction was a projected 13.5% decrease in on-site treatment from 3.6 million pounds in 1996 to 3.1 million pounds in 1998. Off-site energy recovery was expected to decrease from 164,000 pounds to 45,000 pounds, which would represent a 72.5% reduction. Off-site treatment was projected to decrease from 951,000 pounds to 874,000 pounds, or 8.1%. The sector projected a 2.0% reduction in quantities released from 4.6 million pounds to 4.5 million pounds.

Figure 10-10 illustrates the projected percentage change in on-site waste management, off-site waste management, quantities released, and total production-related waste for the leather and leather products sector.

These changes represent small shifts in the ways that the leather and leather products sector expects to manage its TRI chemicals in waste. For example, recycling would increase slightly as a percentage of total production-related waste, both on-site and off-site. However, 44.8% of the sector's total production-related waste was reported as released on- and off-site in 1996, and this percentage would increase somewhat to 47.6%. Thus, releases represent a large and potentially increasing proportion of the sector's waste management, as indicated in these projections. In terms of the waste management hierarchy, as explained in Chapter 1, releases are the least environmentally desirable option for management of TRI chemicals in waste.

Table 10-10. Current Year and Projected Quantities of TRI Chemicals in Waste, 1996-1998: Leather and Leather Products, SIC Code 31

Waste Management Activity	Current Year 1996 Total Pounds	Current Year 1996 Percent of Total	Projected 1997 Total Pounds	Projected 1997 Percent of Total	Projected 1998 Total Pounds	Projected 1998 Percent of Total
On-site Waste Management						
Recycled On-site	604,322	5.9	634,631	6.6	575,031	6.1
Energy Recovery On-site	0	0.0	0	0.0	0	0.0
Treated On-site	3,620,694	35.6	3,240,079	33.7	3,133,300	33.4
Off-site Waste Management						
Recycled Off-site	272,493	2.7	285,890	3.0	288,363	3.1
Energy Recovery Off-site	164,107	1.6	59,516	0.6	45,106	0.5
Treated Off-site	951,319	9.4	860,670	8.9	874,011	9.3
Quantity Released On- and Off-site	4,555,945	44.8	4,539,310	47.2	4,464,143	47.6
Total Production-related Waste for SIC Code 31	10,168,880	100.0	9,620,096	100.0	9,379,954	100.0

Waste Management Activity	Projected Change 1996-1997 Percent	Projected Change 1997-1998 Percent	Projected Change 1996-1998 Percent
On-site Waste Management			
Recycled On-site	5.0	-9.4	-4.8
Energy Recovery On-site	--	--	--
Treated On-site	-10.5	-3.3	-13.5
Off-site Waste Management			
Recycled Off-site	4.9	-0.9	5.8
Energy Recovery Off-site	-63.7	-24.2	-72.5
Treated Off-site	-9.5	1.6	-8.1
Quantity Released On- and Off-site	-0.4	-1.7	-2.0
Total Production-related Waste for SIC Code 31	-5.4	-2.5	-7.8

Note: Current year and projected year amounts are all taken from Section 8 of Form R for 1996.

Source Reduction Activity

In 1996, 55 forms in the leather and leather products sector indicated one or more source reduction activities underway during the year, as shown in Table 10-11. This was one-fourth (24.7%) of all forms submitted by this sector. The leather tanning and finishing industry (SIC code 3111) submitted 38 of these forms (22.9% of the forms submitted by that industry).

Raw material modifications was one of the source reduction activities most often indicated (23 forms). This type of activity often represents more innovative projects to reduce or eliminate toxic chemicals in waste. Surface preparation and finishing was also

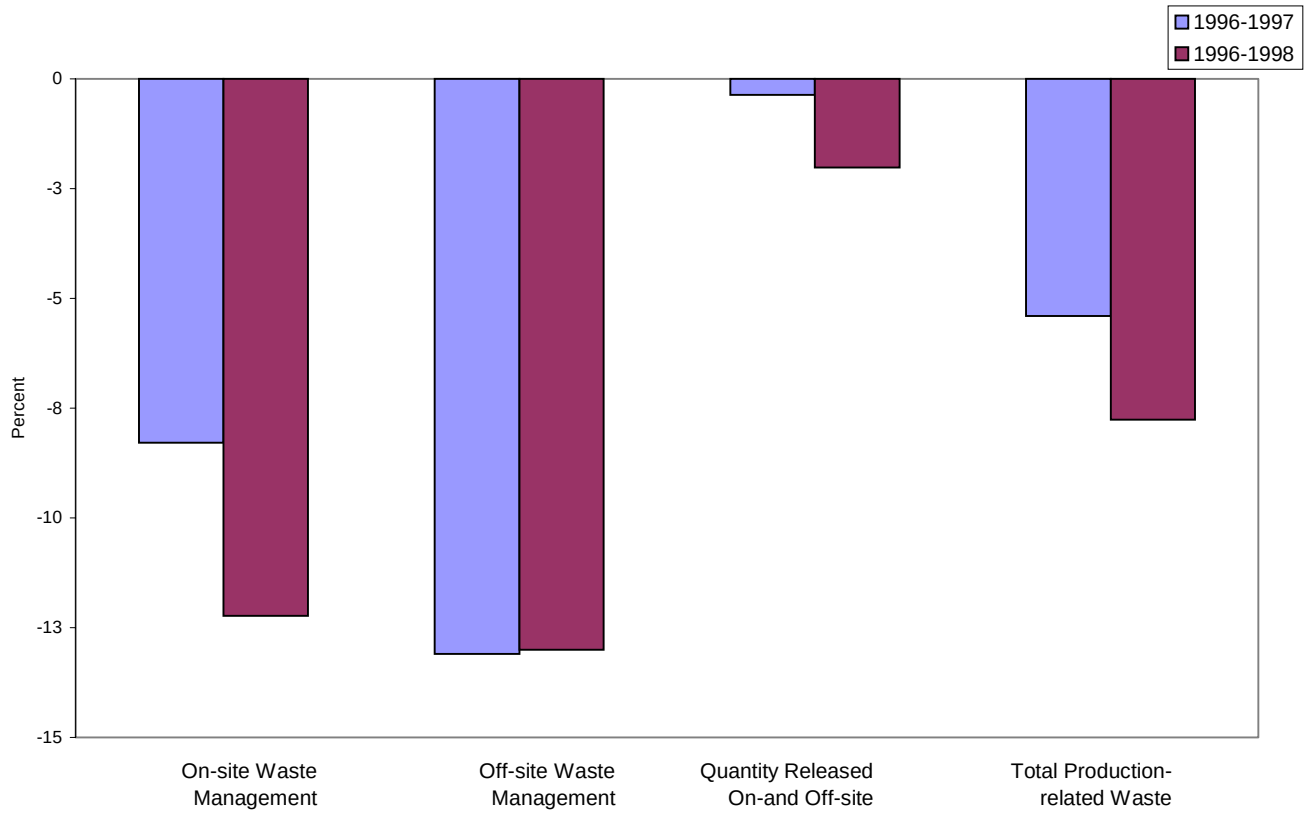


Figure 10-10. Projected Percentage Change in Quantities of TRI Chemicals in Waste, 1996-1998: Leather and Leather Products (SIC Code 31)

Note: Current year and projected year amounts are all taken from Section 8 of Form R for 1996.

Table 10-11. Number of Forms Reporting Source Reduction Activity, 1996: Leather and Leather Products, SIC Code 31

SIC Code	Industry	Total Forms	Forms Reporting Source Reduction Activities		Category of Source Reduction Activity							
					Good Operating Practices	Inventory Control	Spill and Leak Prevention	Raw Material Modifications	Process Modifications	Cleaning and Degreasing	Surface Preparation and Finishing	Product Modifications
		Number	Number	Percent	Number	Number	Number	Number	Number	Number	Number	Number
3111	Leather Tanning & Finishing	166	38	22.9	8	1	4	11	4	3	21	1
3131	Footwear Cut Stock	1	0	0.0	0	0	0	0	0	0	0	0
3143	Men's Footwear, Except Athletic	16	10	62.5	1	2	0	8	0	0	0	4
3144	Women's Footwear, Except Athletic	3	2	66.7	1	0	0	1	0	0	2	0
3149	Footwear, Except Rubber, nec*	15	5	33.3	2	0	0	3	0	2	0	0
	Multiple within SIC Code 31	11	0	0.0	0	0	0	0	0	0	0	0
	Invalid SIC Code within SIC Code 31	11	0	0.0	0	0	0	0	0	0	0	0
	Total for SIC Code 31	223	55	24.7	12	3	4	23	4	5	23	5

Note: Forms with more than one 4-digit SIC code within code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

frequently indicated (also 23 forms), reflecting the importance of this type of activity in the leather tanning and finishing industry.

Year-to-Year Comparisons for Leather and Leather Products

1995-1996 TRI Data for Leather and Leather Products

The number of forms submitted by the leather and leather products sector decreased from 251 in 1995 to 223 in 1996, as shown in Table 10-12.

On- and Off-site Releases

Total on- and off-site releases reported by the leather and leather products sector decreased 5.2% from 1995 to 1996, as shown in Table 10-12. The sector reported 4.5 million pounds of total releases in 1995 and 4.2 million pounds in 1996. Reported air emissions decreased from 2.9 million in 1995 to 2.7 million in 1996 (a reduction of 8.7%). Reductions were reported in both fugitive and point-source air emissions. Surface water discharges decreased from 113,000 pounds to 54,000 pounds (a 52.8% reduction). On-site land releases also decreased, from 15,000 pounds to 7,000 pounds (55.5%).

The leather and leather products sector reported an increase in off-site releases (transfers to disposal), the only release type with an increase in this sector for 1995-1996. Transfers to disposal rose from 1.4 million pounds to 1.5 million pounds. This was an increase of 6.0%.

Figure 10-11 illustrates the percentage change in releases reported by the leather and leather products sector.

Other On-site Waste Management

The leather and leather products sector reported 4.5 million pounds of other on-site waste management in 1995 and 4.2 million pounds in 1996, a 6.2% reduction, as shown in Table 10-12. All three methods of waste management showed decreases. On-site recycling decreased 2.9%, from 622,000 pounds to 604,000 pounds, and on-site treatment decreased 5.4% from 3.8 million pounds to 3.6 million pounds. The sector reported 56,000 pounds of on-site energy recovery in 1995, and none in 1996.

Transfers Off-site for Further Waste Management

The leather and leather products sector reported decreases in off-site transfers to recycling and energy recovery from 1995 to 1996, while transfers to treatment and POTWs increased. The net change in the sector's reported transfers off-site for further waste management was a reduction of 8.2%, from 2.0 million pounds to 1.8 million pounds. Table 10-12 presents the sector's reporting of transfers off-site for further waste management for 1995 and 1996.

In this sector, transfers to recycling decreased 23.4%, from 441,000 pounds to 338,000 pounds. Transfers to energy recovery decreased 37.8%, from 269,000 pounds to 167,000 pounds. The sector reported relatively small amounts of transfers to treatment, but these transfers increased 150.4%, from 12,000 pounds to 29,000 pounds. The largest type of off-site transfer for further waste management in this sector—transfers to POTWs—increased from 1.27 million pounds to 1.29 million pounds, an increase of 1.9%.

Table 10-12. Comparison of TRI On-site and Off-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1995-1996: Leather and Leather Products, SIC Code 31

	1995 Number	1996 Number	Change 1995 to 1996 Percent
Total Facilities	97	89	-8.2
Total Forms	251	223	-11.2
Form Rs	231	209	-9.5
Form As	20	14	-30.0
	Pounds	Pounds	Percent
On-site Releases			
Total Air Emissions	2,907,485	2,654,927	-8.7
Fugitive Air	882,616	747,962	-15.3
Point Source Air	2,024,869	1,906,965	-5.8
Surface Water Discharges	113,360	53,526	-52.8
Underground Injection	0	0	--
On-site Land Releases	14,843	6,611	-55.5
Total On-site Releases	3,035,688	2,715,064	-10.6
Off-site Releases			
Transfers Off-site to Disposal	1,440,001	1,526,825	6.0
Total On- and Off-site Releases	4,475,689	4,241,889	-5.2
Other On-site Waste Management			
Recycled On-site	622,116	604,322	-2.9
Energy Recovery On-site	55,500	0	-100.0
Treated On-site	3,828,717	3,620,694	-5.4
Total Other On-site Waste Management	4,506,333	4,225,016	-6.2
Transfers Off-site for Further Waste Management			
Transfers to Recycling	440,743	337,555	-23.4
Transfers to Energy Recovery	268,536	167,073	-37.8
Transfers to Treatment	11,591	29,024	150.4
Transfers to POTWs	1,266,405	1,290,230	1.9
Other Off-site Transfers	0	0	--
Total Transfers Off-site for Further Waste Management	1,987,275	1,823,882	-8.2

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995. Other Off-site Transfers are transfers reported without a valid waste management code.

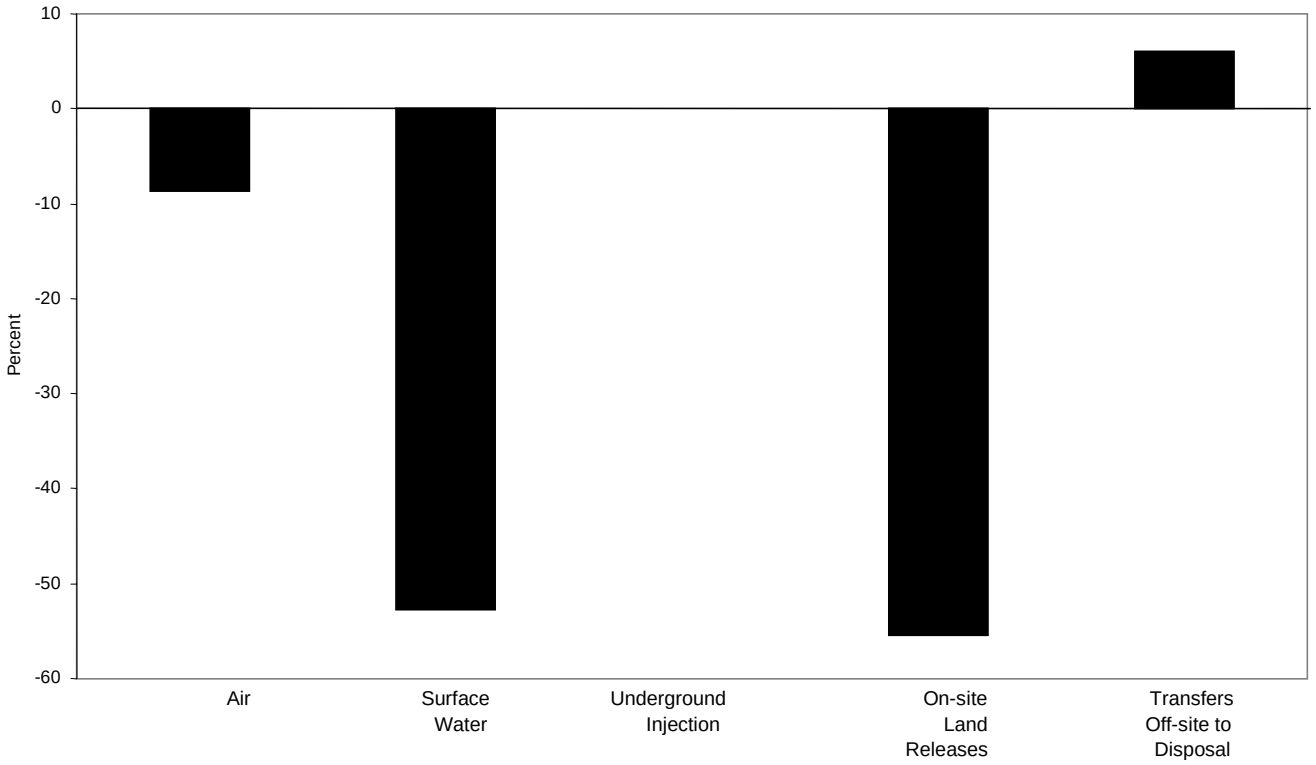


Figure 10-11. Percentage Change in On-site and Off-site Releases, 1995-1996: Leather and Leather Products (SIC Code 31)

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995.

1988-1996 TRI Data for Leather and Leather Products

As explained in Chapter 1, comparisons from the 1988 TRI baseline year to the current year rely on the list of "core" TRI chemicals that were reportable, with the same reporting definition, in all years. These multi-year comparisons also review only the data elements that were collected in all years, which excludes from this section any analysis that distinguishes RCRA subtitle C landfills from other land releases as well as analysis based on the types of underground injection wells. On-site waste management data and transfers off-site to recycling and to energy recovery have been collected only since 1991; these data are included, but cannot be compared across the full 1988-1996 period.

From 1988 to 1996, the number of forms submitted to TRI by the leather and leather products sector decreased by about half (47.9%), from 282 forms to 147 forms. During this period, the sector also reduced reported on- and off-site releases from 13.0 million pounds to 3.8 million pounds, a 70.7% reduction. These data appear in Table 10-13.

All types of on-site releases reported by this sector decreased from 1988 to 1996, as shown in Table 10-13. Air emissions exhibited the largest reduction, from 11.7 million pounds to 2.3 million pounds, or 80.2%. The largest portion of the overall reduction occurred in reporting of point-source emissions (from 9.4 million pounds to 1.7 million pounds), although fugitive air emissions also decreased (from 2.2 million pounds to 568,000 pounds). On-site land releases decreased from

Table 10-13. Comparison of TRI On-site and Off-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1988 and 1994-1996: Leather and Leather Products, SIC Code 31

	1988 Number	1994 Number	1995 Number	1996 Number	Change 1988 to 1996 Percent
Total Facilities	137	98	82	81	-40.9
Total Forms	282	177	167	147	-47.9
Form Rs	282	177	156	144	-48.9
Form As	NA	NA	11	3	NA
	Pounds	Pounds	Pounds	Pounds	Percent
On-site Releases					
Total Air Emissions	11,692,677	3,660,926	2,599,137	2,309,389	-80.2
Fugitive Air	2,247,960	983,445	693,456	568,439	-74.7
Point Source Air	9,444,717	2,677,481	1,905,681	1,740,950	-81.6
Surface Water Discharges	3,302	1,967	1,600	2,060	-37.6
Underground Injection	0	0	0	0	--
On-site Land Releases	231,937	16,059	14,723	5,982	-97.4
Total On-site Releases	11,927,916	3,678,952	2,615,460	2,317,431	-80.6
Off-site Releases					
Transfers Off-site to Disposal	1,095,701	1,425,439	1,410,961	1,496,071	36.5
Total On- and Off-site Releases	13,023,617	5,104,391	4,026,421	3,813,502	-70.7
Other On-site Waste Management					
Recycled On-site	NA	658,304	620,791	604,322	NA
Energy Recovery On-site	NA	0	55,500	0	NA
Treated On-site	NA	1,702,691	1,609,388	906,297	NA
Total Other On-site Waste Management	NA	2,360,995	2,285,679	1,510,619	NA
Transfers Off-site for Further Waste Management					
Transfers to Recycling	NA	499,037	434,713	328,155	NA
Transfers to Energy Recovery	NA	270,203	259,792	157,543	NA
Transfers to Treatment	1,151,152	22,020	6,690	13,403	-98.8
Transfers to POTWs	814,909	629,324	524,995	485,130	-40.5
Other Off-site Transfers	4,715	0	0	0	-100.0
Total Transfers Off-site for Further Waste Management	NA	1,420,584	1,226,190	984,231	NA

Note: Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R**. Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996. For 1994-1996, Other Off-site Transfers are transfers reported without a valid waste management code. For 1988, Other Off-site Transfers are transfers reported without a valid waste management code or codes not required to be reported in 1988. **NA:** not required to be reported in that year.

232,000 pounds to 6,000 pounds, or 97.4%. A reduction was also reported in surface water discharges, of 37.6%, but very small amounts were reported in this category (3,000 pounds in 1988 and 2,000 in 1996).

The leather and leather products sector reported an increase in off-site releases (transfers to disposal) from 1.1 million pounds in 1988 to 1.5 million pounds in 1996. This amounted to an increase of more than one-third (36.5%).

Figure 10-12 displays the percentage change in release types reported in the leather and leather products sector from 1988 to 1996.

On-site waste management and transfers off-site for recycling or energy recovery were not collected in 1988. For the 1994-1996 period, total other on-site waste management reported by this sector decreased from 2.4 million pounds to 1.5 million pounds. This reflected a reduction in reporting of on-site treatment from 1.7 million pounds to 906,000 pounds. Amounts reported for on-site recycling also decreased, from 658,000 pounds to 604,000 pounds. For the 1994-to-1996 period shown in Table 10-13, the sector reported energy recovery only in 1995 (56,000 pounds).

The sector's reported transfers to treatment decreased 98.8% from 1988 to 1996, from 1.2

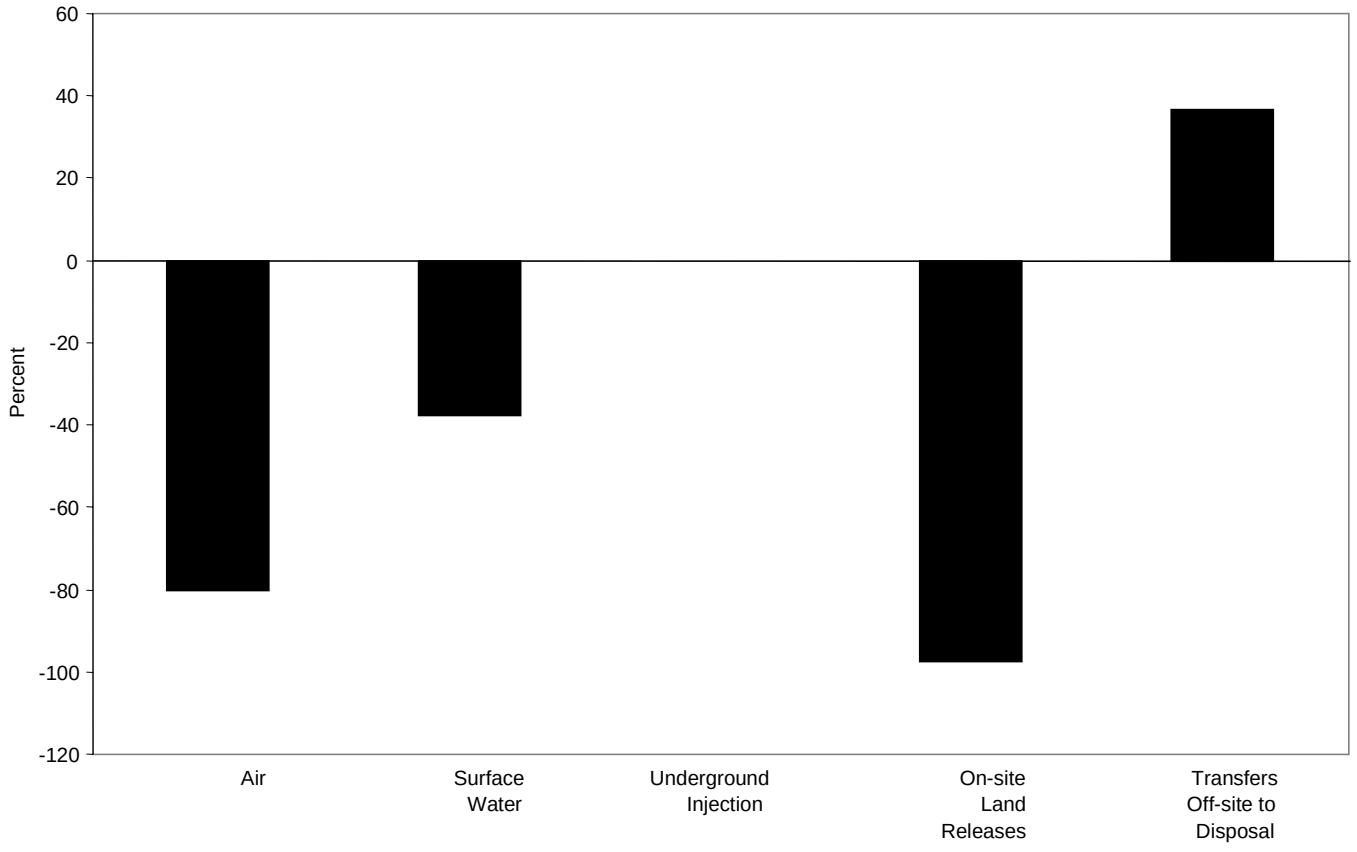


Figure 10-12. Percentage Change in On-site and Off-site Releases, 1988-1996: Leather and Leather Products (SIC Code 31)

Note: Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996.

million pounds to 13,000 pounds. Transfers to POTWs also decreased, by 40.5%, from 815,000 pounds to 485,000 pounds.

1988-1996 Data for Four-Digit Industries in Leather and Leather Products

Tables 10-14 through 10-16 summarize data for 1988 and 1994-1996 for industries at the four-digit SIC code level within SIC code 31. The tables present, respectively, on- and off-site releases, other on-site waste management, and transfers off-site for further waste management.

On- and Off-site Releases

Table 10-14 provides release data for all four-digit SIC codes in the leather and leather products sector, for 1988-1996. The leather tanning and finishing industry (SIC code 3111) reported the largest decrease in on- and off-site releases. This industry reported total releases of 7.2 million pounds in 1988 and 3.1 million pounds in 1996. Air emissions were the largest factor in this reduction, along with a smaller reduction in on-site releases to land. The industry's reporting of off-site releases (transfers to disposal) increased over this period.

The women's footwear industry (SIC code 3144) ranked second for decreases, reporting 472,000 pounds in 1988 and 30,000 pounds in 1996. Men's footwear (SIC code 3143) ranked third, with 591,000 pounds in 1988 and 239,000 pounds in 1996. Virtually all of the releases and reductions reported in both industries were in air emissions.

One industry group reported an increase from 1988 to 1996. This was the multiple-codes group, which reported 158,000 pounds of on- and off-site releases in 1988 and 221,000 pounds in 1996. Total releases reported on forms with multiple SIC codes varied from year to year, as is evident in Table 10-14. Almost all of the releases reported in the multiple-codes group were air emissions.

Other On-site Waste Management

The leather tanning and finishing industry (SIC code 3111) reported the sector's largest decrease in other on-site waste management from 1994 to 1996 (on-site waste management data were not collected in 1988). This industry reported 2.3 million pounds in 1994 and 1.5 million pounds in 1996. This reflected a large reduction in on-site treatment, along with a smaller decrease in on-site recycling.

The miscellaneous footwear industry (SIC code 3149) ranked second for decreases in other on-site waste management. This industry reported less than 3,000 pounds in 1994 and 1995 and 600 pounds in 1996, all in on-site recycling.

Men's footwear (SIC code 3143) reported a net increase for this period, from zero pounds in 1994 to 6,000 pounds in 1996 although the total was larger (8,000 pounds) in 1995. This industry also reported only on-site recycling.

Other leather and leather products industries did not report in the comparison years or reported only zero amounts of other on-site waste management.

On-site waste management data for 1994-1996 appear in Table 10-15.

Transfers Off-site for Further Waste Management

As with on- and off-site releases and other on-site waste management, the leather tanning and finishing industry (SIC code 3111) reported the largest reduction in transfers off-site for further waste management from 1994 to 1996 (data for some types of off-site transfers were not collected in 1988). The leather tanning and finishing industry reported 1.1 million pounds of such transfers in 1994 and 951,000 pounds in 1996. This industry reported decreases in all types of transfers except transfers to recycling.

Table 10-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Leather and Leather Products, SIC Code 31

SIC Code	Industry	Year	On-site Releases: Total Air Emissions (Pounds)	On-site Releases: Surface Water Discharges (Pounds)	On-site Releases: Underground Injection (Pounds)	On-site Releases: Releases to Land (Pounds)	Total On-site Releases (Pounds)	Off-site Releases: Transfers Off-site to Disposal (Pounds)	Total On- and Off-site Releases (Pounds)
3111	Leather Tanning & Finishing	96	1,614,599	2,060	0	5,982	1,622,641	1,492,640	3,115,281
		95	1,658,662	1,600	0	14,723	1,674,985	1,409,309	3,084,294
		94	2,304,637	1,967	0	16,059	2,322,663	1,417,601	3,740,264
		88	6,208,035	2,052	0	186,937	6,397,024	825,531	7,222,555
3131	Footwear Cut Stock	96	250	0	0	0	250	0	250
		95	14,293	0	0	0	14,293	0	14,293
		94	10,180	0	0	0	10,180	1,216	11,396
		88	154,070	0	0	0	154,070	800	154,870
3142	House Slippers	96	No reports received						
		95	750	0	0	0	750	0	750
		94	13,000	0	0	0	13,000	0	13,000
		88	250	0	0	0	250	0	250
3143	Men's Footwear, Except Athletic	96	238,641	0	0	0	238,641	24	238,665
		95	288,454	0	0	0	288,454	26	288,480
		94	503,324	0	0	0	503,324	0	503,324
		88	590,406	250	0	0	590,656	0	590,656
3144	Women's Footwear, Except Athletic	96	29,683	0	0	0	29,683	0	29,683
		95	120,824	0	0	0	120,824	0	120,824
		94	111,950	0	0	0	111,950	250	112,200
		88	472,247	250	0	0	472,497	0	472,497
3149	Footwear, Except Rubber, nec*	96	203,649	0	0	0	203,649	0	203,649
		95	320,437	0	0	0	320,437	0	320,437
		94	358,583	0	0	0	358,583	0	358,583
		88	378,829	750	0	0	379,579	19,628	399,207
3161	Luggage	96	No reports received						
		95	10,863	0	0	0	10,863	0	10,863
		94	19,100	0	0	0	19,100	0	19,100
		88	136,412	0	0	0	136,412	750	137,162
3199	Leather Goods, nec*	96	No reports received						
		95	No reports received						
		94	No reports received						
		88	2,631	0	0	0	2,631	0	2,631
	Multiple within SIC Code 31	96	221,114	0	0	0	221,114	0	221,114
		95	184,331	0	0	0	184,331	0	184,331
		94	299,751	0	0	0	299,751	0	299,751
		88	156,137	0	0	0	156,137	2,000	158,137
	Invalid SIC Code within SIC Code 31	96	1,453	0	0	0	1,453	3,407	4,860
		95	523	0	0	0	523	1,626	2,149
		94	40,401	0	0	0	40,401	6,372	46,773
		88	3,593,660	0	0	45,000	3,638,660	246,992	3,885,652
	Total for SIC Code 31	96	2,309,389	2,060	0	5,982	2,317,431	1,496,071	3,813,502
		95	2,599,137	1,600	0	14,723	2,615,460	1,410,961	4,026,421
		94	3,660,926	1,967	0	16,059	3,678,952	1,425,439	5,104,391
		88	11,692,677	3,302	0	231,937	11,927,916	1,095,701	13,023,617

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified

Table 10-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Leather and Leather Products, SIC Code 31

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3111	Leather Tanning & Finishing	96	597,780	0	872,412	1,470,192
		95	609,663	55,500	1,506,339	2,171,502
		94	655,639	0	1,608,016	2,263,655
		88	NA	NA	NA	NA
3131	Footwear Cut Stock	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
3142	House Slippers	96	No reports received			
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
3143	Men's Footwear, Except Athletic	96	5,900	0	0	5,900
		95	8,200	0	0	8,200
		94	0	0	0	0
		88	NA	NA	NA	NA
3144	Women's Footwear, Except Athletic	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
3149	Footwear, Except Rubber, nec*	96	642	0	0	642
		95	2,928	0	0	2,928
		94	2,665	0	0	2,665
		88	NA	NA	NA	NA
3161	Luggage	96	No reports received			
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
3199	Leather Goods, nec*	96	No reports received			
		95	No reports received			
		94	No reports received			
		88	NA	NA	NA	NA
	Multiple within SIC Code 31	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
	Invalid SIC Code within SIC Code 31	96	0	0	33,885	33,885
		95	0	0	103,049	103,049
		94	0	0	94,675	94,675
		88	NA	NA	NA	NA
	Total for SIC Code 31	96	604,322	0	906,297	1,510,619
		95	620,791	55,500	1,609,388	2,285,679
		94	658,304	0	1,702,691	2,360,995
		88	NA	NA	NA	NA

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

The multiple-codes group ranked second for decreases in transfers off-site for further waste management, reporting 19,000 pounds in 1994 and 800 pounds in 1996. Women's footwear (SIC code 3144) ranked third, with 14,000 pounds in 1994 and 3,000 pounds in 1996. Both reported reductions occurred principally in transfers to energy recovery.

Among leather and leather products industries, only the men's footwear industry (SIC code 3143) reported an increase in transfers off-site for further waste management for 1994 to 1996. This industry reported 11,000 pounds in 1994, 5,000 pounds in 1995, and 21,000 pounds in 1996. Increases were reported in transfers to energy recovery and to treatment.

Table 10-16 provides multi-year data by four-digit SIC codes for these transfer types.

Facilities with Large Increases and Decreases in Releases, 1988-1996

Pfister & Vogel Leather in Milwaukee, Wisconsin (SIC code 3111), ranked first in increases of releases with 200,000 pounds. The chemical glycol ethers was responsible for all of the facility's increase. The tannery switched some of its coating processes from solvent-based materials to water-based materials. Glycol ethers is a component of the water-based coatings. The facility's reporting of solvents decreased over the 1988-1996 period, including decreases of 128,000 pounds in xylene releases and 51,000 pounds in 2-methoxyethanol releases.

Blackhawk Leather, Ltd., in Milwaukee, Wisconsin (SIC code 3111), was second in increases with an overall 141,000 pounds. An automotive leather manufacturer, the Blackhawk facility reported 83,000 pounds more chromium compounds (59% of the increase) transferred off-site for disposal. Chromium is integral to leather tanning and acts as a preservative. Waste sludge from the tanning process and leather scraps containing chromium are sent to off-site landfills. The facility attributed the increase to increased production.

Eagle Tanning Company in Waterloo, Iowa (did not report in 1988, SIC code 3111 in 1996), was the third-ranked facility for increases with 91,000 pounds. The tannery reported 91,000 pounds of chromium compounds in 1996, all in the category of transfers off-site to disposal. The facility came into operation in 1988 and did not use chromium compounds until the 1989 reporting year.

The top decreaser for releases was Eagle Ottawa Leather Company in Grand Haven, Michigan (SIC code 3111). This manufacturer of automobile upholstery leather had an overall decrease of 2.7 million pounds, 33% of which was accounted for by the elimination of methyl ethyl ketone from its coating process. Toluene, acetone, and methyl isobutyl ketone were also eliminated when Eagle Ottawa switched from solvent-based coatings to water-based coatings. Eagle Ottawa, a participant in EPA's 33/50 Program, received an Environmental Quality Award from the Michigan Chamber of Commerce for its environmental record.

Irving Tanning Company in Hartland, Maine (SIC code 3111), ranked second in decreases with 1.3 million pounds. This facility substituted an unlisted solvent for 2-methoxyethanol, used in leather coating operations. 2-Methoxyethanol, reported as fugitive and point-source air emissions in 1988, accounted for 62% of the facility's overall decrease. No data were reported for the chemical in 1996. Irving Tanning tans leather to customer specifications. Their customers produce finished leather goods.

Seton Company in Newark, New Jersey (SIC code 3111), was third in decreases with 671,000 pounds. Elimination of methyl ethyl ketone accounted for 49% of Seton's reduction. In 1992, this plant transferred its leather finishing operations to another Seton facility in Pennsylvania. Methyl ethyl ketone and other solvents used in coating

Table 10-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Leather and Leather Products, SIC Code 31

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3111	Leather Tanning & Finishing	96	326,480	134,957	5,389	484,081	0	950,907
		95	191,268	219,526	144	523,742	0	934,680
		94	271,117	229,625	8,267	627,824	0	1,136,833
		88	NA	NA	1,052,614	778,566	4,715	NA
3131	Footwear Cut Stock	96	0	0	0	750	0	750
		95	0	0	1,292	750	0	2,042
		94	0	0	0	750	0	750
		88	NA	NA	0	750	0	NA
3142	House Slippers	96	No reports received					
		95	0	0	500	0	0	500
		94	0	0	250	0	0	250
		88	NA	NA	0	0	0	NA
3143	Men's Footwear, Except Athletic	96	980	12,222	7,931	0	0	21,133
		95	736	3,031	1,267	0	0	5,034
		94	2,090	4,079	5,021	0	0	11,190
		88	NA	NA	250	0	0	NA
3144	Women's Footwear, Except Athletic	96	0	3,393	0	0	0	3,393
		95	0	20,826	0	0	0	20,826
		94	0	13,690	750	0	0	14,440
		88	NA	NA	8,250	0	0	NA
3149	Footwear, Except Rubber, nec*	96	0	6,573	0	0	0	6,573
		95	7,487	4,738	500	0	0	12,725
		94	6,080	5,669	2,350	0	0	14,099
		88	NA	NA	14,757	0	0	NA
3161	Luggage	96	No reports received					
		95	0	0	0	0	0	0
		94	0	0	0	0	0	0
		88	NA	NA	0	0	0	NA
3199	Leather Goods, nec*	96	No reports received					
		95	No reports received					
		94	No reports received					
		88	NA	NA	0	1,023	0	NA
	Multiple within SIC Code 31	96	440	398	0	0	0	838
		95	1,470	11,671	2,895	0	0	16,036
		94	0	17,140	1,572	0	0	18,712
		88	NA	NA	0	750	0	NA
	Invalid SIC Code within SIC Code 31	96	255	0	83	299	0	637
		95	233,752	0	92	503	0	234,347
		94	219,750	0	3,810	750	0	224,310
		88	NA	NA	75,281	33,820	0	NA
	Total for SIC Code 31	96	328,155	157,543	13,403	485,130	0	984,231
		95	434,713	259,792	6,690	524,995	0	1,226,190
		94	499,037	270,203	22,020	629,324	0	1,420,584
		88	NA	NA	1,151,152	814,909	4,715	NA

Note: Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 31 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

processes were, therefore, no longer used at the Newark facility or they were used in small enough quantities to be below the reporting threshold. The Seton Company contact added that the Pennsylvania facility has recently switched from solvent-based coating processes to water-based processes.

1991-1996 Waste Management Data for Leather and Leather Products

Table 10-17 summarizes on- and off-site waste management data for the leather and leather products sector for 1991, when TRI began collecting this information, and the three most recent years (1994-1996). From 1991 to 1996, total production-related waste reported by the leather and leather products sector decreased by two-thirds (65.1%) from 18.0 million pounds to 6.3 million pounds.

Reductions were reported in all waste management types except on-site treatment (which increased 32.5%, from 684,000 pounds to 906,000 pounds). The sector's largest reduction (in pounds) was reported in quantities released on- and off-site, from 9.1 million pounds in 1991 to 3.9 million pounds in 1996. The second-largest reduction was reported in on-site recycling, from 5.5 million pounds to 604,000 pounds. These changes amounted to reductions of 56.8% and 89.0%, respectively.

Total off-site waste management decreased 68.9%, from 2.7 million pounds in 1991 to 835,000 pounds in 1996, reflecting reductions in all three waste management methods. Off-site recycling decreased from 937,000 pounds to 263,000 pounds, off-site energy recovery decreased from 1.1 million pounds to 155,000 pounds, and off-site treatment decreased from 615,000 pounds to 417,000 pounds.

Figure 10-13 illustrates the 1991-1996 percentage change in the sector's total production-related waste, by type of waste management.

TRI facilities report absolute amounts of waste managed and of environmental releases, not adjusted for changes in production levels. As noted early in this chapter, production in the leather and leather products sector declined sharply through the 1990s. However, reporting of total production-related waste decreased even more rapidly.

At the same time, the 1991-1996 record indicates that the sector is managing its waste in less desirable ways over time. In terms of the waste management hierarchy (explained in Chapter 1), recycling is the preferred option for TRI chemicals in waste that cannot be prevented. Treatment is preferred only above releases, the least environmentally desirable waste management option. From 1991 to 1996, the leather and leather products sector reported substantial decreases in recycling, a net increase in treatment, and less rapid decreases in releases. The result of these changes is that the sector reported recycling a much smaller portion of its production-related waste, while increasing the portion of production-related waste that it released.

Facilities with Large Increases and Decreases in Waste Management, 1991-1996

Law Tanning in Milwaukee, Wisconsin (did not report in 1988, SIC code 3111 in 1996), was first in increases of waste managed with 130,000 pounds. Chromium compounds accounted for 100% of the increase. The facility purchases blue drop splits (tanned leather that is split off of a hide to get a desired thickness) and manufactures "suede split." Leather trimmed from the suede split product is sent off-site for recycling. In 1993, the facility changed its location, thereby changing its TRI facility identification number. Because no data were reported under the identification number for the new location prior to 1993, the facility appeared to have a 130,000 pound increase in chromium compounds reported as recycled off-site and quantity released. The original location reported 87,000 pounds for these same reporting categories

Table 10-17. TRI Waste Management Data, 1991, 1994-1996: Leather and Leather Products, SIC Code 31

Waste Management Activity	1991 Pounds	1994 Pounds	1995 Pounds	1996 Pounds
On-site Waste Management				
Recycled On-site	5,503,083	658,304	620,791	604,322
Energy Recovery On-site	0	0	55,500	0
Treated On-site	684,252	1,702,691	1,609,388	906,297
Total On-site Waste Management	6,187,335	2,360,995	2,285,679	1,510,619
Off-site Waste Management				
Recycled Off-site	936,712	555,371	445,300	263,093
Energy Recovery Off-site	1,136,350	272,980	264,511	154,577
Treated Off-site	614,893	613,767	504,033	416,961
Total Off-site Waste Management	2,687,955	1,442,118	1,213,844	834,631
Quantity Released On- and Off-site	9,135,066	4,947,855	4,042,532	3,941,804
Total Production-related Waste	18,010,356	8,750,968	7,542,055	6,287,054
Non-Production-related Waste	14,980	5	1	0

Waste Management Activity	Change 1994-1995 Percent	Change 1995-1996 Percent	Change 1991-1996 Percent
On-site Waste Management			
Recycled On-site	-5.7	-2.7	-89.0
Energy Recovery On-site	--	-100.0	--
Treated On-site	-5.5	-43.7	32.5
Total On-site Waste Management	-3.2	-33.9	-75.6
Off-site Waste Management			
Recycled Off-site	-19.8	-40.9	-71.9
Energy Recovery Off-site	-3.1	-41.6	-86.4
Treated Off-site	-17.9	-17.3	-32.2
Total Off-site Waste Management	-15.8	-31.2	-68.9
Quantity Released On- and Off-site	-18.3	-2.5	-56.8
Total Production-related Waste	-13.8	-16.6	-65.1
Non-Production-related Waste	-80.0	-100.0	-100.0

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated.

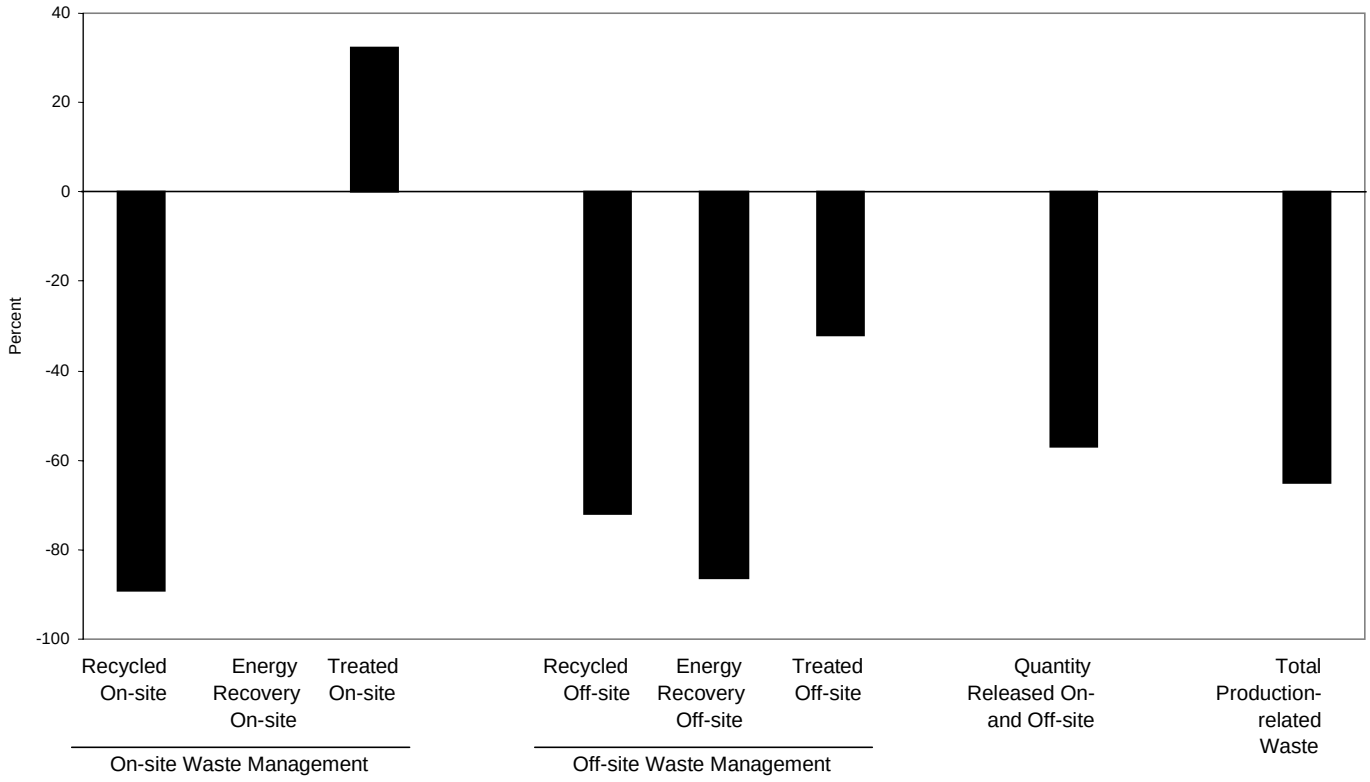


Figure 10-13. Percentage Change in Quantities of TRI Chemicals in Waste, 1991-1996: Leather and Leather Products (SIC Code 31)

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated.

in 1991. The increase in reported chromium compounds between the two facilities was due to a production increase.

Prime Tanning Corporation in Saint Joseph, Missouri (SIC code 3111), second in increases, had an overall increase of 125,000 pounds. Phosphoric acid had the biggest influence on the change, accounting for 44% of the increase between 1991 and 1996. The facility, which manufactures leather for shoes, boots, and upholstery, uses phosphoric acid in a wastewater pretreatment system. Phosphoric acid is neutralized upon introduction to the activated sludge system and supplies phosphate as a nutrient to biological organisms that aid in waste biodegradation. Between 1991 and 1996, the activated sludge system was found to be performing poorly due to a phosphate deficiency. As a result, the facility increased the amount of phosphoric acid introduced into the system.

Twin City Tanning in South Saint Paul, Missouri (SIC code 3111), was third in increases with 119,000 pounds. This custom tannery uses manganese sulfate in a wastewater pretreatment system to oxidize sulfides that are used to de-hair cattle hides. Reported manganese compounds were responsible for 88% of the facility's increase. The pretreatment system was installed in 1991 and was, therefore, not in operation for the entire reporting year.

Pfister & Vogel Leather in Milwaukee, Wisconsin (SIC code 3111), ranked first in decreases of waste managed with an overall 4.7 million-pound reduction. Chromium compounds accounted for all of the decrease. Trivalent chromium ion, the

primary chemical component of the tanning process, migrates from an aqueous solution, or "chrome liquor," into rawhide and bonds to the material, creating leather. The used chrome liquor, along with water used to wash the tanned hides, is pumped to a recycling system where chromium is isolated and prepared for reuse. The reported decrease in on-site recycling of chromium compounds was due a change in estimation methodology. According to the facility contact, in 1991 the amount of chromium reported as recycled on-site was estimated on the basis of the total weight of chromium compounds recycled (e.g., the amount of the chromium and the other elements making up the compound). After 1991, this figure was calculated using only the weight of chromium.

Garden State Tanning in Fleetwood, Pennsylvania (SIC code 3111), was second in decreases of waste managed with a reduction of 1.4 million pounds. A manufacturer of automotive leather, this facility used toluene and other solvents in a finish-coating process. Late in 1991, an incinerator that burned emissions from the facility's finish drying ovens broke down. Instead of replacing the incinerator, Garden State opted to initiate a source reduction program, with guidance from the Pennsylvania Department of Environmental Resources, that involved phasing out high-VOC, solvent-based coatings and substituting water-based coatings. Consequently, toluene, methyl ethyl ketone, and methyl isobutyl ketone were eliminated. Toluene reporting accounted for 44% of the facility's overall decrease between 1991 and 1996. This plant was a participant of the EPA's 33/50 Program. All three of the eliminated solvents were 33/50 chemicals.

Garden State Tanning in Williamsport, Maryland (SIC code 3111), ranked third in decreases with an overall 981,000 pounds. Like its counterpart in Freeport, Pennsylvania, this manufacturer of automotive leather eliminated emissions of high VOC solvents by switching from solvent-based finish-coating operations to water-based operations. Toluene accounted for 43% of the reduction in waste managed at the Williamsport plant between 1991 and 1996.

Facilities Contacted for Explanations (alphabetical by facility):

Blackhawk Leather, Ltd., Milwaukee, Wisconsin: Paul Holzman, September 1, 1998 (explanation provided)

Eagle Ottawa Leather Company, Grand Haven, Michigan: Scott Braspenninx, September 1, 1998 (explanation provided)

Eagle Tanning Company, Waterloo, Iowa: John Vankamen, September 1, 1998 (explanation provided)

Garden State Tanning, Inc., Fleetwood, Pennsylvania and Williamsport, Maryland: Chris Ehret, September 1 and September 30, 1998 (explanation provided)

Irving Tanning Company, Hartland, Maine: Richard Holden, September 1, 1998 (explanation provided)

Law Tanning Company, Milwaukee, Wisconsin: Thomas Squire, September 1 and September 30, 1998 (explanation provided)

Pfister & Vogel Leather, Milwaukee, Wisconsin: Michael J. Travis, August 31 and September 1, 1998 (explanation provided)

Prime Tanning Corporation, Saint Joseph, Missouri: Rick A. Ream, September 1, 1998 (explanation provided)

Seton Company, Newark, New Jersey: Juan Flores and Carl Zipfel, September 1, 1998 (explanation provided)

Twin City Tanning Company, L.L.P., South Saint Paul, Missouri: John N. Smith, September 1, 1998 (explanation provided)